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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,606	10/22/2003	Koichi Sakamoto	F03-161818M/SW	4797

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EXAMINER	
TRAN, NHAN T	
ART UNIT	**PAPER NUMBER**
2622	

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10/31/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/689,606	SAKAMOTO ET AL.	
	Examiner	Art Unit	
	Nhan T. Tran	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS; WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6 and 8-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6 and 8-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/19/2007 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1-3, 6, 8-19 have been considered but are moot in view of the new ground of rejection.

It should be also noted that the Applicant's arguments against the combination of the teachings of Sannoh, Lobo and Lou for the unrelated art, lack of motivation to combine references and impermissible hindsight have been addressed by the Examiner in the previous office action mailed 7/20/2007.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 & 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sannoh et al. (US 2003/0071908) in view of Luo et al. (US 7,092,573).

Regarding claim 1, Sannoh discloses an image processing method for performing image processing on image data (see abstract) comprising:

generating face region information to identify the face region from said image data (see Figs. 1-9 and [0092]);

determining an operating mode (i.e., still mode or motion mode) of a device performing said image processing, wherein face identification is performed when the determined operating mode comprises a high-speed operating mode (see [0073], [0086] and [0092], it is noted that "a high-speed mode" is considered as the motion mode that is different from the still mode since "a high-speed mode" is broadly recited);

Although Sannoh teaches face identification when the high-speed mode is determined (the face detection is set on as shown in Fig. 3, and the motion mode is switch on), Sannoh is silent as to performing noise on the face region of said image data based on said face region information.

However, as taught by Luo, an image processing apparatus performs image enhancement (Fig. 1, steps 40, 44, 60, 70) including noise reduction in addition to color balance adjustments on a human face region (face region 95 shown in Fig. 3) of an image *after* the face region was identified by face region identification algorithm so as to

enhance the image based on the detected region (see Luo, col. 7, lines 36-38; col. 11, lines 17-22, 37-42).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the apparatus in Sannoh to include the teaching of Luo for reducing noise on the identified face region so as to enhance the image as suggested by Luo in col. 11, lines 37-42.

Regarding claim 6, Sannoh in view of Luo as discussed in claim 1 also teaches executable program that realizes the method in claim 1 (see Sannoh, [0002] and col. 12, line 66 – col. 13, line 10).

4. Claims 2, 3, 8-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sannoh et al. (US 2003/0071908) and Lobo et al. (US 5,835,616) and in further view of Luo et al. (US 7,092,573).

Regarding claim 2, Sannoh discloses a digital camera (Figs. 1 & 2 and [0071]) comprising:

an image processing unit (image processing unit as shown in Figs. 2 & 25) that performs image processing (e.g., CDS, AGC, face detection, exposure control, compression, etc.) on a shot image (Figs. 1 & 25, [0074]-[0079]);

a face region identification unit (face detection algorithm shown in Fig. 4 executed by the CPU 115a) that analyzes an image to generate face region information to identify the face region (see Figs. 1-9 and [0092]);

a photography mode determination unit (CPU 115a and mode switch 212) that determines the photography mode (i.e., still mode or motion mode) of said shot image (see [0073]);

a control unit (CPU 115a) that operates said face region identification unit when a high-speed photography mode (motion mode) is set (see [0092]).

Sannoh does not explicitly disclose the image processing means performing a contour correction on the shot image *before* identifying a face region.

In the same field of endeavor, Lobo teaches an imaging processing apparatus that performs contour correction (edge enhancer at a first stage 110 in Fig. 2 that corrects contour of objects or so called edges of objects in an image to help identifying a face region) in a first stage (110) prior to actual detecting stages (120-150 and 210-270) for detecting a face region (chin, face oval, eyes, nose, mouth) on an image so as to increase intensity variation at an edge in the image in order to better set forth curved shapes of a facial image for subsequent face detection stages (see Lobo; Abstract; Figs. 1-3 and col. 3, line 54 – col. 4, line 52).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a contour correction processing before identifying a face region in the camera of Sannoh so that the intensity variation near an

edge of an image subject is increased to better set forth curved shapes of a facial image for subsequent face detection stages as suggested by Lobo.

As discussed above, Sannoh in view of Lobo teaches processing to correct contour on a shot image before face detection for detecting a face region and then other image processes are executed after contour correction and face detection depending on a photographing mode (still mode or motion mode which is equated to "a high-speed photography mode").

Sannoh and Lobo do not explicitly teach a noise reduction unit for performing noise reduction on the face region of the image after contour correction based on said face region information, and said noise reduction unit is operated by the control unit.

However, as taught by Luo, an image processing apparatus performs image enhancement (Fig. 1, steps 40, 44, 60, 70) including noise reduction in addition to color balance adjustments on a human face region (face region 95 shown in Fig. 3) of an image *after* the face region was identified by face region identification algorithm so as to further enhance the image based on the detected region (see Luo, col. 7, lines 36-38; col. 11, lines 17-22, 37-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Sannoh, Lobo and Luo to arrive at the applicant's claimed invention by additionally providing a noise reduction unit to the digital camera for performing noise reduction on the face region of the image after face identifying process (also after contour correction as discussed above) based on said face region information, and said noise reduction unit is operated by the control

unit when the high-speed photography is set. As doing this, the image quality would be further enhanced by removing noise in addition to color adjustments on the detected face region of the image as suggested by Luo in col. 11, lines 37-42.

Regarding claim 3, Sannoh also discloses that the digital camera further comprising: a photography mode switch (212 in Fig. 1c) on a main body of said camera, wherein said photographing mode determination unit determines said photographing mode based on a mode selection signal from the photographing mode switch on the camera main body (see [0073]).

Regarding claim 8, Sannoh and Lobo in view of Luo also discloses that the noise reduction unit performs noise reduction exclusively on said face region using a low-pass filter (see Luo, col. 2, lines 60-66; col. 7, lines 36-38 and col. 8, lines 51-52).

Regarding claim 9, Sannoh and Lobo in view of Luo further discloses that said face region comprises a plurality of face regions (see Sannoh, Figs. 6A-6D), said face region deification unit identifying said plurality of face regions and said nose reduction unit performing noise reduction on said plurality of face regions (see Luo, col. 5, line 51).

Regarding claim 10, Sannoh and Lobo in view of Luo also teaches that said control unit controls said face region identification unit and said noise reduction unit

such that said analyzing said information to identify said face region (see Luo, col. 2, lines 60-66 and col. 7, lines 36-38) and said noise reduction are not performed when a mode (i.e., landscape mode in Sannoh, [0136]) other than a high-speed photography mode is determined by said photography mode determination unit (note that, in the landscape mode, the face detection is not executed in Sannoh and thus the noise reduction on face regions is neither executed in the combination of Sannoh, Lobo and Luo).

Regarding claim 11, Sannoh further discloses a shutter button (211 in Fig. 1c) and an operation switch (212, 213, 214 in Fig. 1c) which are connected to said control unit (Fig. 2), wherein said control unit performs control including at least one of automatic focus, automatic exposure based on an input from one of said shutter button and said operation switch (see [0072]-[0075]).

Regarding claim 12, it is clear in Sannoh, [0092] and Fig. 2 that a lens comprises an automatic focus mechanism.

Regarding claim 13, it is clearly seen in Sannoh that a CCD (102) is in a position corresponding to a focal point of said lens (see Fig. 2 and [0092]).

Regarding claim 14, Sannoh also discloses an analog processor (CDS and AGC 103 in Fig. 2) for performing analog processing on a picture signal which is output from

said CCD (102). Although Sannoh teaches that color signals output from the analog processor are converted into YUV signals, Sannoh is silent about the color signals being RGB signals (see [0077]).

However, an Official Notice is taken that it is well known in the art to implement popular RGB color filters on the CCD for producing RGB color signals which are then subject to analog CDS, AGC processing prior to YUV conversion process since RGB color space provides several advantages in image processing such as exposure change, brightness/contrast and color correction, etc.

Therefore, it would have been obvious to one of ordinary skill in the art to provide RGB color filters on the CCD so that the analog processor would easily process the color signals in RGB color space for performing exposure control and other processing prior to be converted into YUV.

Regarding claim 15, Sannoh and Lobo in view of Luo teaches that said analog signal processor comprises a Correlated Double Sampling (CDS in Fig. 2 of Sannoh) circuit for performing noise reduction on said picture signal, and an Automatic Gain Control (AGC in Fig. 2 of Sannoh) circuit for performing level adjustment on said picture signal by way of gain adjustment (see Sannoh, [0076])

Regarding claim 16, as shown in Fig. 2 of Sannoh, an analog-to-digital (A/D circuit in 103) converter which converts said RGB signals sequentially applied by the analog signal processor to digital RGB signals (note the analysis of claim 14).

Regarding claim 17, Sannoh clearly discloses a digital signal processor (IPP 104 in Fig. 2) for converting said digital RGB signals to image data comprising luminance (Y) data and color-difference data (U and V) (see [0076]-[0077] and note the analysis of claim 14).

Regarding claim 18, Sannoh further discloses a memory (DRAM 107) for temporarily storing said image data (see Fig. 2 and [0079]).

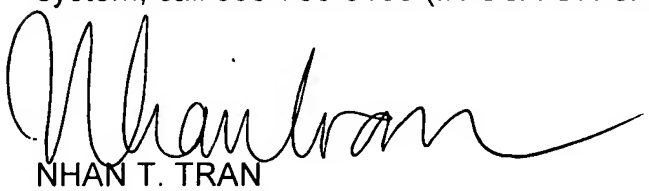
Regarding claim 19, it is also clear in Sannoh that said face region identification unit receives said image data from said memory (DRAM 107) and generates said face region information by using said image data (see [0092]).

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nhan T. Tran whose telephone number is (571) 272-7371. The examiner can normally be reached on Monday - Friday, 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



NHAN T. TRAN
Patent Examiner